



QUICK START GUIDE



Cisco ASR 1002 Router

- 1 Documentation and Resources
- 2 Prepare for Installation
- 3 Rack-Mount the Router
- 4 Connect the Router to the Network
- 5 Start the System
- 6 Configuring the Router
- 7 After Installation

1 Documentation and Resources

Documentation for the Cisco 1000 Series Aggregation Services Routers documentation is available online, with the exception of the regulatory compliance and safety documentation and the *Cisco 1000 Series Aggregation Services Routers* documentation. For detailed hardware installation instructions, refer to the [Cisco ASR 1000 Series Aggregation Services Routers Hardware Installation Guide](#). Refer to the following documentation for information about installation and replacement of parts (including shared port adapters) and regulatory compliance information:

- Shared port adapter(SPA) documentation—See the [Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Hardware Installation Guide](#)
- Configuration documentation—See the [Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide](#)
- Regulatory compliance information-See the [Regulatory Compliance and Safety Information for the Cisco ASR 1000 Series Aggregation Services Routers](#)

Document Revision History

The Document Revision History table displays the changes made to this document.

Document Version	Date	Change Summary
OL-15411-05	November 2009	Added information about +24 V DC power supply information pertaining to the Cisco ASR1002 Router.
OL-15411-04	February 2009	General updates.
OL-15411-03	November 2008	Included information about the improved two-minute window allotted time to replace a power supply. You now have up to a maximum of five minutes to replace a power supply.
OL-15411-02	September 2008	General updates.
OL-15411-01	July 2008	First version of this document.

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2 Prepare for Installation

This section contains information about the tools and parts, warnings, site preparation information, and other information for the rack-mount installation and equipment shelf or tabletop installation.



Warning

Only trained and qualified personnel should install, replace, or service this equipment. Statement 1030



Caution

The eUSB panel door on the side of the Cisco ASR 1002 Router must not be opened. If there is a problem with eUSB flash card, the chassis should be returned.

Before beginning the installation of this router, read the [Regulatory Compliance and Safety Information for the Cisco ASR 1000 Series Aggregation Services Routers](#) document.

Site Preparation and Unpacking

Ensure that the following guidelines are followed:

- Lift the router safely out of the packing container.
- Ensure that the power service at the site is suitable for the router you are installing.
- Check the packing slip to ensure that all the correct components are present.
- Locate the Site Log and ensure that it is accessible for recording information about the installation.

Tools and Parts

Use the following list of tools and parts as a checklist for preparing to install the Cisco ASR 1002 Router:

- ESD-preventive wrist strap
- AC power cord
- Appropriate cables to connect the router to the network and to the console terminal
- Tape measure and level (optional)
- Number 2 Phillips screwdriver and 3.5 mm or 3/16 inch flat-blade screwdriver
- Two chassis ground lugs and four screws
- The rack-mount and cable-management kit:
 - Four 19-inch rack-mount brackets (with front and rear rails) and two cable-management brackets
 - Three sets of screws: one set for the front rack-mount brackets (packaged with several black screws), another set for the rear rack-mount brackets (packaged with several screws), and a set for the cable-management brackets (packaged with four screws).

Prepare for Equipment Shelf Installation or Tabletop Installation

For an equipment shelf installation or tabletop installation, verify the following before installing the router:

- The router is off the floor and has adequate ventilation.
- An adequate chassis ground (earth) connection exists for the router.
- The router needs at least 3 inches (7.62 cm) of clearance at the inlet and exhaust vents (at the front and rear of the router).
- The router needs 19 inches (48.26 cm) of clearance at the front and rear to allow for installation or to access cables or equipment.

Prepare for Rack-Mount Installation

Before you begin the rack-mounting tasks:

- Decide whether or not you want to rear-mount the chassis from the front or the rear.
- Decide whether or not you want to attach cable-management brackets to your chassis.



Note If you install cable-management brackets, ensure that you use the rack-mount ear holes specified in the procedure described in and install the brackets after the chassis is mounted on the equipment rack.

- Decide if two-post or four-post rack-mount equipment will be used.

3 Rack-Mount the Router

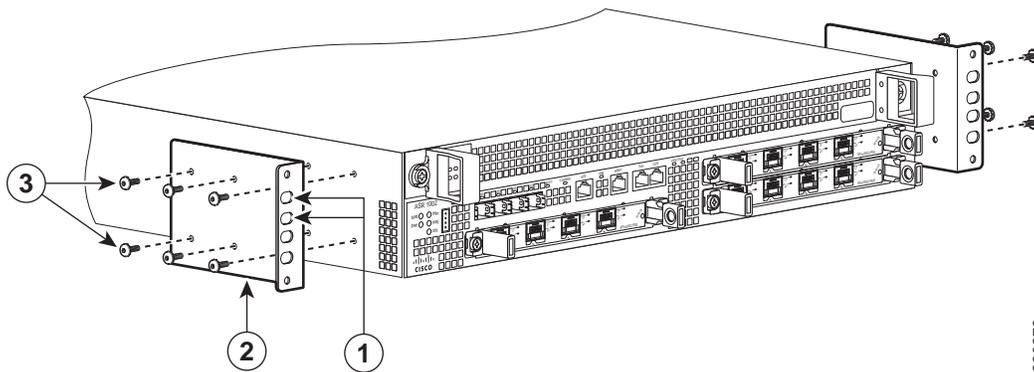
This section provides information about rack-mounting the router.

Attach the Rack-Mount Brackets—Chassis Front-Mounted

To attach the rack-mount brackets on a Cisco ASR 1002 Router for a front rack-mount configuration, follow these steps:

- Step 1** Locate the threaded holes in the front sides of the chassis.
- Step 2** Align the rack-mount bracket to the side of the router. Ensure that you hold the rear rack-mount bracket such that the ear holes are facing outward and towards the rear of the chassis. Depending on which set of rack-mount bracket holes you choose to use to attach the rack-mount bracket to the router, the chassis will either be recessed into the rack or protrude from the rack.
- Step 3** Position the front rack-mount bracket's top hole with the chassis, first top hole behind the side vent holes, as shown in [Figure 1](#).

Figure 1 Front Rack-Mount Brackets in the Cisco ASR 1002 Router



1	Front rack-mount bracket ear and holes	3	Front rack-mount bracket screws
2	Front rack-mount bracket		

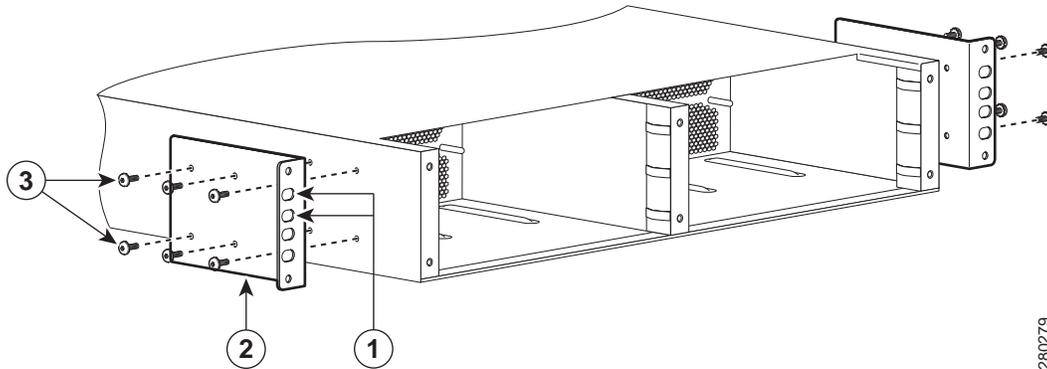
- Step 4** Insert and tighten the black screws on one side.
- Step 5** Repeat Step 1 through Step 4 on the other side of the chassis. Use black screws to secure the rack-mount brackets to the chassis.
- Step 6** To install the cable-management brackets, see the procedure described in the [“Attach a Cable-Management Bracket” section on page 9](#).

Attach the Rack-Mount Brackets—Chassis Rear-Mounted

To install the rack-mount brackets on a Cisco ASR 1002 Router in a rear rack-mount configuration, follow these steps:

- Step 1** Locate the threaded ear holes in the rear sides of the chassis.
- Step 2** Position the rear rack-mount bracket's top hole with the chassis from the back (See [Figure 2](#)). Ensure that you hold the rear rack-mount bracket with the ear holes facing outward and towards the rear of the chassis. Align the rack-mount bracket to the side of the router.

Figure 2 Installing the Cisco ASR 1002 Router Rear Rack-Mount Brackets



1	Rear rack-mount bracket ear and holes	3	Rear rack-mount bracket screws
2	Rear rack-mount bracket		

- Step 3** Insert and tighten the screws. After the bracket is secured to the side of the chassis, slide the two remaining components into the side rack-mount bracket.
- Step 4** Repeat Step 1 through Step 3 on the other side of the chassis. Use the screws on each side to secure the rear rack-mount brackets to the chassis.

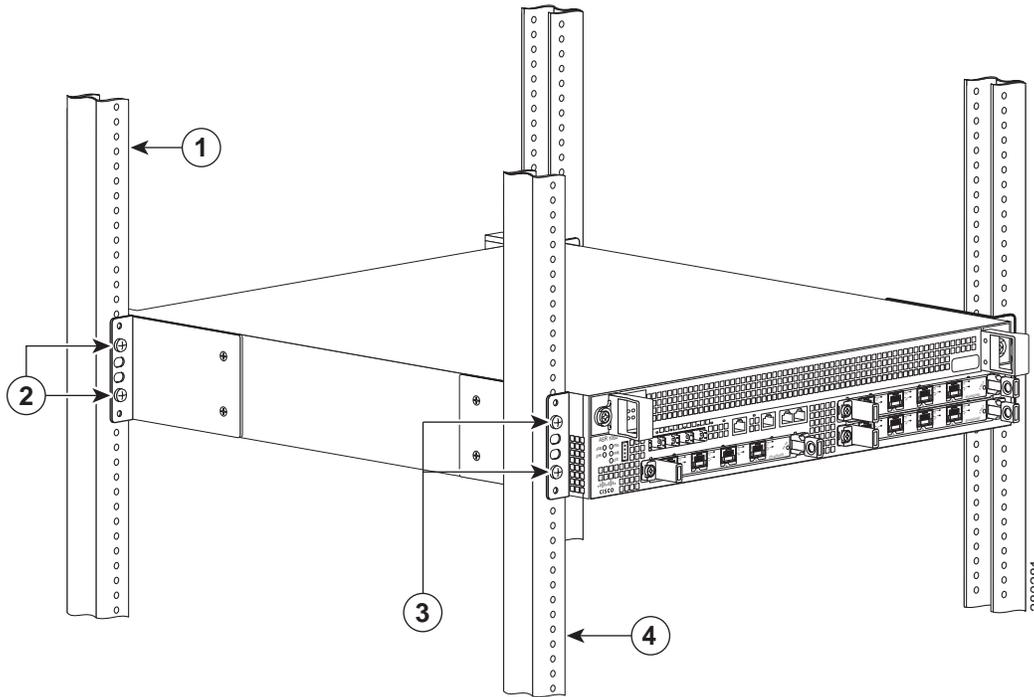
This completes the procedure for attaching rear rack-mount brackets to the chassis. Continue to the procedure described in the [Four-Post Rack Installation](#), page 5 or the [Two-Post Rack Installation](#), page 7.

Four-Post Rack Installation

 **Note** We recommend that you allow at least 1 or 2 inches (2.54 or 5.08 cm) of vertical clearance between the router and the equipment directly above and below the router.

Figure 3 shows the Cisco ASR 1002 Router in a four-post rack.

Figure 3 Installing the Cisco ASR 1002 Router in a Four-Post Rack - Front and Rear Rack-Mounting



1	Rear rack equipment rail	3	Front rack-mount bracket ear and holes
2	Rear rack-mount bracket ear and holes	4	Front rack equipment rail

 **Note** Because the rack-mount brackets support the weight of the entire chassis, use all the screws to fasten the two rack-mount brackets on the chassis to the rack posts.

 **Note** Ensure that you attach the cable-management brackets to the chassis after you install the chassis in an equipment rack.

To install the chassis in the four-post rack, complete the following steps:

- Step 1** Make sure that the rack brakes are locked and the rack is stabilized.
- Step 2** Mount the chassis by securing the rack-mount brackets to two posts or mounting strips in the rack using the screws provided.
- Step 3** On the chassis, ensure that all the screw fasteners on the installed components are securely tightened.
- Step 4** Make sure that your path to the rack is unobstructed. If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.
- Step 5** Lift the chassis into position between the rack posts (requires two people).
- Step 6** Align the mounting bracket holes with the rack post holes and attach the chassis to the rack. At this point, if there is a third person, that person can insert the screws, while the other two people hold the chassis in place, unless the chassis is resting on a shelf).
- Step 7** Position the chassis such that the rack-mounting ears are flush with the mounting rails on the rack.

Step 8 Insert the bottom screw first and then the second screw at the top of the chassis, diagonally from the bottom screw. This helps secure the chassis in place while you insert the other screws.



Tip To ensure that there is sufficient space to attach the cable-management brackets to the chassis in the rack easily, use the rack-mount bracket ear holes specified in Step 9.

Step 9 Hold the chassis in position against the mounting rails and perform these steps:



Tip Insert the bottom screw first and then the second screw at the top of the chassis diagonally from the bottom screw. This helps secure the chassis in place while you insert the other screws.

- a. Insert the bottom screw into the second ear hole from the bottom of the rack-mount ear and use a hand-held screwdriver to tighten the screw to the rack rail.
- b. Insert the top screw into the second bracket hole from the top of the rack-mount bracket ear hole diagonally from the bottom screw and tighten the screw to the rack rail. See [Figure 3](#).
- c. Repeat these Step a and Step b for the other side of the chassis.



Note When the specified rack-mount bracket ear holes are used, the cable-management brackets can be easily attached to the rack-mount bracket after the chassis is in the rack.

This completes the procedure for installing the chassis in a four-post rack. Proceed to the procedure described in the [“Attach a Cable-Management Bracket” section on page 9](#) to continue the installation.

Two-Post Rack Installation



Caution If you are using a two-post rack, secure the two-post rack to the floor surface to prevent tipping and avoid bodily injury and component damage. Or use a four-post rack.

Before you begin to install the Cisco ASR 1002 Router in a two-post equipment rack, read these important notes:

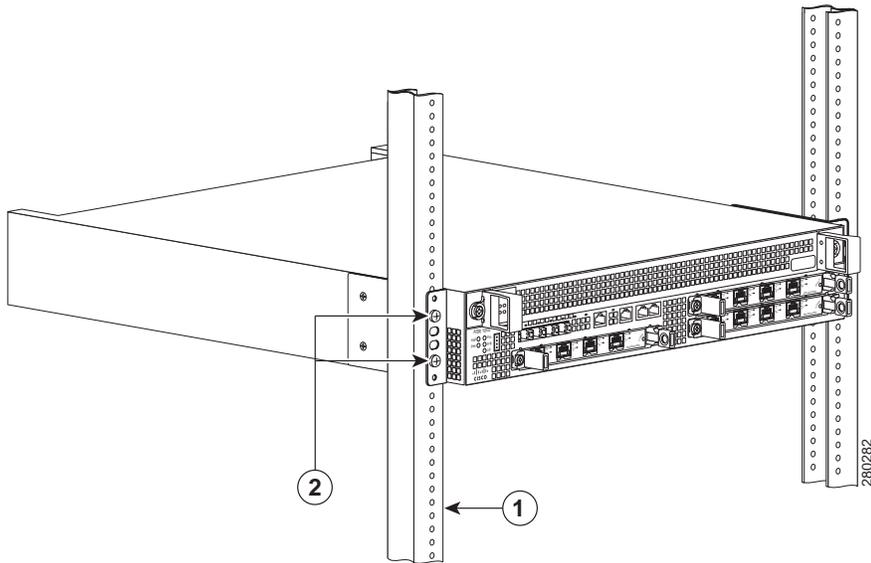
- Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm). Airflow through the chassis is from front to back.
- To prevent the two-post rack from tipping and avoid bodily injury or component damage, ensure that you secure the two-post equipment rack to the floor.
- Never attempt to lift an object that might be too heavy for you to lift by yourself. We recommend that at least two people install the router in an equipment rack.
- Ensure that the floor under the rack supporting the Cisco 1000 Series Routers is capable of supporting the combined weight of the rack and all the other installed equipment.



Note Ensure that you attach the cable-management brackets to the chassis after you install the chassis in an equipment rack.

Figure 4 shows the Cisco ASR 1002 Router in a two-post rack.

Figure 4 Installing a Cisco ASR 1002 Router in a Two-Post Rack



1	Rack equipment rail	2	Rack-mount bracket ear and holes
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To install the Cisco ASR 1002 Router in a two-post equipment rack, perform the following steps:

-
- Step 1** Position the chassis such that the front is closest to you and lift it carefully into the rack. To prevent injury, avoid any sudden twists or moves.
- Step 2** Slide the chassis into the rack, pushing it back until the rack-mount brackets meet the mounting strips or posts on both sides of the rack.
- Step 3** Position the chassis until the rack-mounting ears are flush against the mounting rails on the rack.



Tip To provide enough space to attach the cable-management brackets to the chassis in the rack easily, ensure that you use the rack-mount bracket ear holes specified in Step 4.

-
- Step 4** Hold the chassis in position against the mounting rails and perform these steps:
- The Cisco ASR 1002 Router rack-mount bracket has four ear holes and two for the cable-management brackets. Insert the bottom screw into the fifth hole from the top of the rack-mount ear, and use a hand-held screwdriver to tighten the screw to the rack rail.
 - Insert the top screw into the second hole from the top of the rack-mount bracket ear hole diagonally from the bottom screw, and tighten the screw to the rack rail. See [Figure 4](#).
- Step 5** Repeat Steps 3 and Step 4 for the other side of the chassis.



Note If you use the specified rack-mount bracket ear holes, the cable-management brackets can be easily attached to the rack-mount bracket after the chassis is in the rack.

This completes the procedure for installing the chassis in a two-post rack. Proceed to the procedure described in the “[Attach a Cable-Management Bracket](#)” section on page 9 to continue the installation.

Attach a Cable-Management Bracket

The cable-management bracket should be mounted to each rack-mount bracket on the chassis to provide cable-management to both sides of the chassis. These brackets are mounted to the rack-mount brackets using screws to allow easy installation and removal of cables.

The cable-management bracket for the Cisco ASR 1002 Router contain one independent cable-management U type device with two screws for each bracket, and provides cable dressing for each card module slot. In the ASR 1000 Series SPA interface, these brackets work in tandem with the SPA product feature cable-management device to allow the installation and removal of adjacent cards without the need to remove cables.



Note Ensure that the cable-management bracket U type device is facing upwards when you attach it to the chassis.

Perform these steps to attach the cable-management brackets to both sides of the Cisco ASR 1002 Router in the rack:

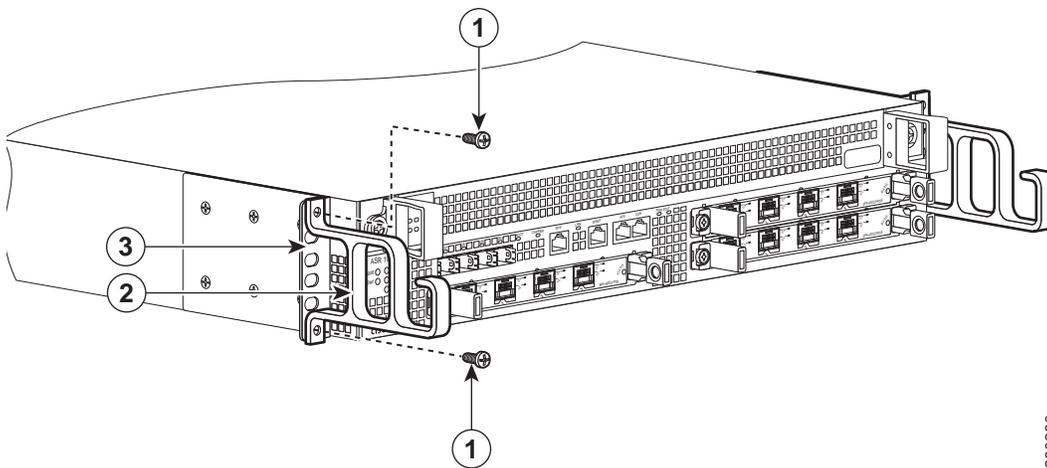
- Step 1** Align the cable-management bracket to the rack-mount bracket on one side of the Cisco ASR 1002 Router. The cable-management bracket should be aligned to the top hole of the chassis rack-mount bracket.
- Step 2** Using a Phillips screwdriver, insert a screw through the cable-management bracket and into the chassis rack-mount bracket, and tighten the screw.



Note Use the package of four screws that came with your Cisco ASR 1002 Router.

- Step 3** Using the bottom rack-mount ear hole, insert the screw through the cable-management bracket and into the chassis rack-mount bracket. [Figure 5](#) shows the cable-management brackets attached to the chassis.

Figure 5 Attaching the Cable-Management Brackets to the Cisco ASR 1002 Router



1	Secure the cable-management bottom screw and top screw to this ear hole	3	Front rack-mount bracket
2	Cable-management U type device		

- Step 4** Using a Phillips screwdriver and cable-management screw, thread and tighten the screw to the cable-management bracket.
- Step 5** Repeat Step 1 through Step 4 for the other side of the Cisco ASR 1002 Router.

This completes the procedure for installing the cable-management brackets on a Cisco ASR 1002 Router for a chassis rack-mount configuration.

Chassis Ground Connection Installation

Connecting the Cisco ASR 1002 chassis to earth ground is required for all DC-powered installations and AC-powered installations where compliance with Telcordia grounding requirements is necessary.



Caution

The dual-lug chassis ground stud must be installed, and all the cards and filler plates must be fully inserted and screwed in and earthed to prevent a potential hazard in a telecom line.

Have the recommended tools and supplies available before you begin this procedure.



Warning

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

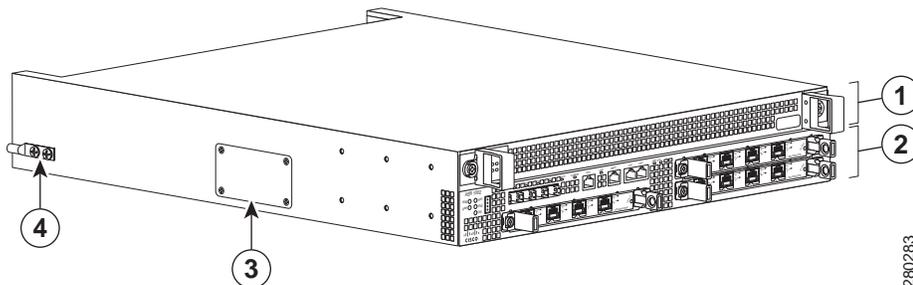
Before you connect the power or turn on the power to your router, you must provide an adequate chassis ground (earth) connection for the Cisco ASR 1002 Router. The chassis ground lugs (two) and the respective screws (four) are provided in the accessory kit that is shipped with your Cisco ASR 1002 Router.

The following tools, equipment, and supplies are necessary to connect the system ground to the chassis:

- Phillips screwdriver
- Dual-lug chassis ground component (two) and respective screws (four)
- Grounding wire

See [Figure 6](#) for the location of the chassis ground connector on the Cisco ASR 1002 Router.

Figure 6 Cisco ASR 1002 Router Ground Connector Location and eUSB Panel Door



1	<p>F0 with Cisco ASR1000-ESP5 or Cisco ASR1000-ESP10</p> <p>Note The Cisco ASR10002 Router does not support the Cisco ASR1000-ESP20 module.</p>	3	The eUSB panel door on the side of the Cisco ASR 1002 Router must not be opened. If there is a problem with the eUSB flash card, the chassis should be returned.
2	R0 slot with embedded ASR1000-RP1 (Cisco ASR1000-RP2 is not supported by the Cisco ASR1002 Router) and embedded ASR1000-SIP10	4	Cisco ASR 1002 Router ground stud location

Perform the following steps to install chassis ground connection:

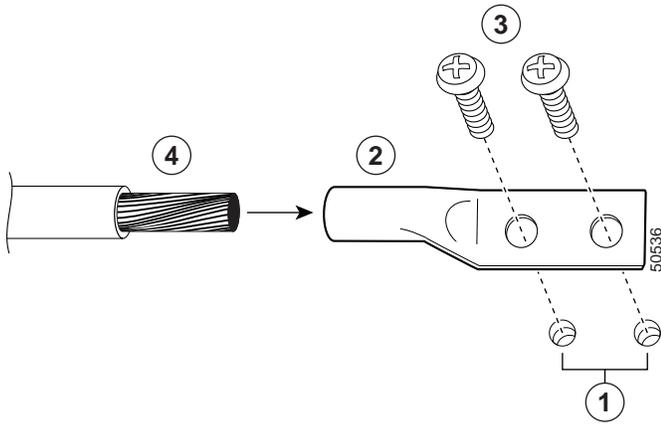
Step 1 Use the wire stripper to strip one end of the AWG #6 wire approximately 0.75 inches (19.05 mm).

Step 2 Insert the AWG #6 wire into the wire receptacle in the grounding lug.

Step 3 Use the manufacturer’s recommended crimping tool to carefully crimp the wire receptacle around the wire. This step is required to ensure a proper mechanical connection.

Figure 7 shows how to attach a ground lug to the chassis ground connector.

Figure 7 Attaching a Grounding Lug to the Chassis Ground Connector

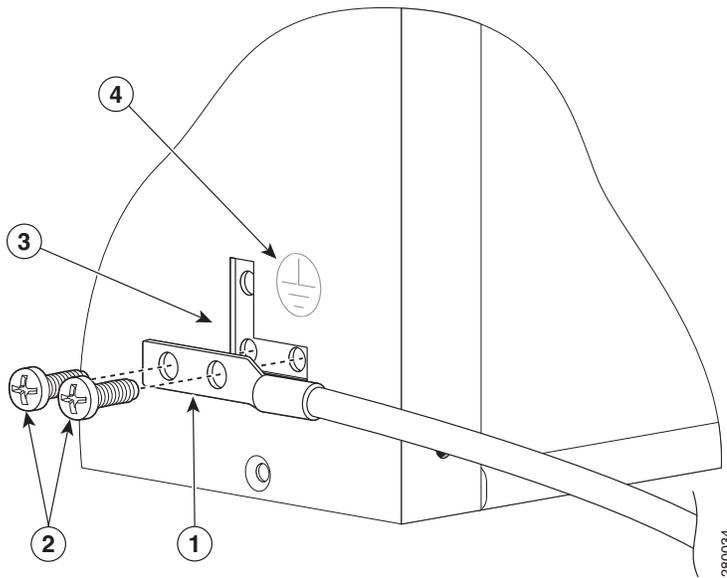


1	Chassis ground connector holes	3	Ground screws
2	Grounding stud	4	Chassis ground lead wire

Step 4 Attach the grounding lug with the wire on the left to avoid having the grounding wire overlapping the power supply.

Step 5 Locate the chassis ground connector on the side of your chassis.

Figure 8 Attaching a Grounding Lug to the Chassis Ground Connector



1	Chassis earth ground studs and lead wire	3	Earth ground connector on the chassis
2	Ground screws	4	Earth ground symbol

- Step 6** Insert the two screws through the holes in the grounding lug.
- Step 7** Use the Number 2 Phillips screwdriver to carefully tighten the screws until the grounding lug is held firmly to the chassis. Do not overtighten the screws.
- Step 8** Connect the opposite ends of the grounding wire to the appropriate grounding point at your site to ensure an adequate chassis ground.

This completes the procedure for attaching a chassis ground connection. Go to the procedure described in the [“Connect the Router to the Network”](#) section on page 12 for information about connecting the router to the network. .

4 Connect the Router to the Network

This section provides information about cables and ports and attaching the router to the network.

- [Console Port Cable and Auxiliary Port Cable Connections, page 12](#)
- [Connect the Ethernet Management Port, page 13](#)
- [Connect the Shared Port Adapter Cables, page 13](#)
- [Install the Cables Using the Cable-Management Brackets, page 13](#)

Console Port Cable and Auxiliary Port Cable Connections

This section describes how to attach a cable to the console port or auxiliary port on the Cisco ASR 1002 Router. The Cisco ASR 1002 Router has two RJ-45 ports for terminal connection. A console port, which can be utilized for terminal connections and an auxiliary port for additional terminal connections as well as diagnostic utilization.

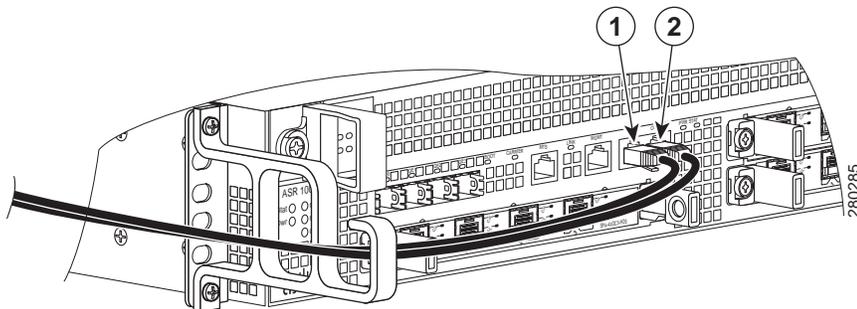


Caution Both the console port and the auxiliary port are asynchronous serial ports; devices connected to these ports must be capable of asynchronous transmission. To meet Class A emission requirements on the Cisco ASR 1002 Router, shielded cables must be used for the console port and auxiliary port connections.

Perform the following steps to connect the console port cable and auxiliary port cable.

- Step 1** Before connecting a terminal to the console port, configure the terminal to match the router console port as follows: 9600 baud, 8 data bits, no parity, 1 stop bit. See [Figure 9](#) for the console port and auxiliary port connector location.

Figure 9 Cisco ASR 1002 Integrated Route Processor Console port and Auxiliary Port Connectors



1	CON—console port	2	AUX—auxiliary port
---	------------------	---	--------------------

- Step 2** Connect to the port using the RJ-45-to-DB-9 cable.

Step 3 After you establish normal router operation, you can disconnect the terminal.



Note For information about console port and auxiliary port pinouts, see the Cisco ASR 1002 Router specifications in the [Cisco ASR 1000 Series Aggregation Services Routers Hardware Installation Guide](#).

Connect the Ethernet Management Port

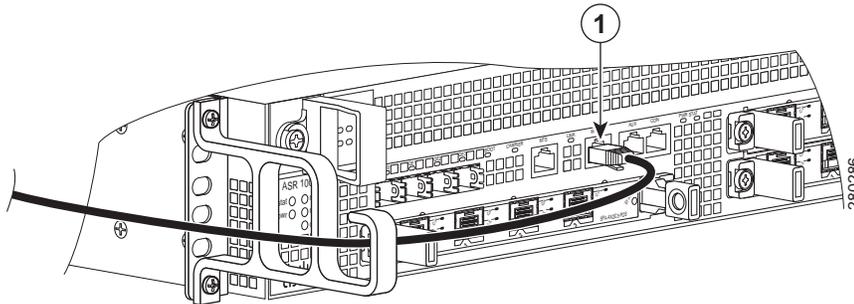


Caution To comply with Class A emissions requirements, a shielded Ethernet cable must be used.

To use the Management Ethernet interface on the router, perform the following steps:

Step 1 Insert an Ethernet RJ-45 cable into the MGMT ETHERNET port (see [Figure 10](#)).

Figure 10 Cisco ASR 1002 Integrated Route Processor Ethernet Management Port Connector



1	MGMT port and cable		
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Step 2 Insert the other end of the RJ-45 cable to your management device or network.

Step 3 Configure to a fixed speed through the command-line interface (CLI) commands.

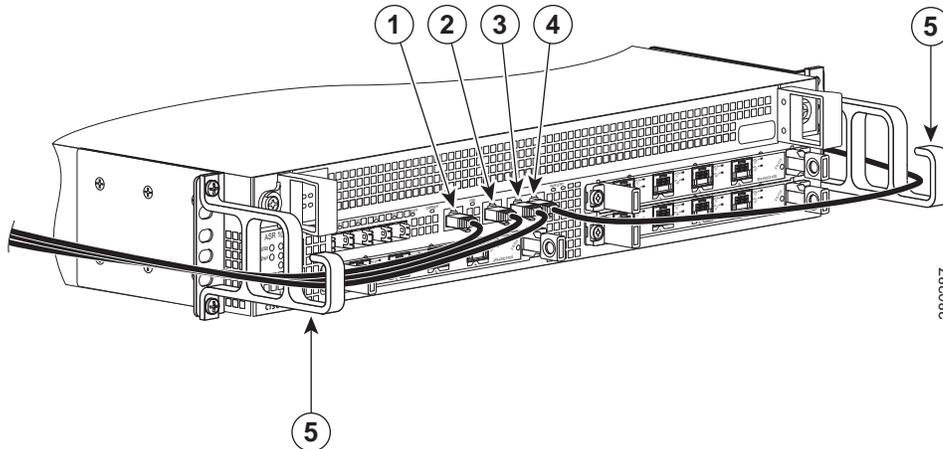
Connect the Shared Port Adapter Cables

The instructions for connecting the cables for the shared port adapters installed in the Cisco ASR 1002 Router are contained in the [Cisco ASR 1000 Series Aggregation Services Routers SPA and SIP Hardware Installation Guide](#).

Install the Cables Using the Cable-Management Brackets

Cables coming off the front side of the Cisco ASR 1002 integrated route processor and SPAs utilize the chassis level cable-management brackets provided on the chassis rack-mount brackets (see [Figure 11](#)).

Figure 11 Cisco ASR 1002 Integrated Route Processor Cable-Managements



1	BITS cable	4	AUX cable
2	MGMT cable	5	Cable-management U feature device
3	CON cable		

To secure shared port adapter interface cables and input or output cables connected to the Cisco ASR 1002 Router, follow these steps:

-
- Step 1** When installing the network interface cables, route the cables up to and through the cable-management bracket U device. If you are using very thin cables that slip through the bracket openings, insert nylon cable ties through the holes in the bracket and wrap them around the cables to secure them.
- Step 2** Route the excess cable out through either end of the bracket, coil it, and secure it to the rack using nylon cable ties or some other mode of attachment.
- Step 3** It might be necessary to bundle longer cables to avoid tangling them. Do this at the cable-management bracket or at the rack, but leave enough slack in the cables to remove a Cisco ASR 1000-ESP5 and change cables as required. Also, do not block the power supply air vents with cables.
-

This completes the procedure for installing the cables in the cable-management bracket.

Proceed to the [“Start the System”](#) section on page 14 to complete the installation.

5 Start the System

Before you start the system, you must connect power to it.

Connect Power to the Cisco ASR 1002 Router

This section provides instructions for connecting power to the Cisco ASR 1002 Router and contains these sections with the following power supplies:

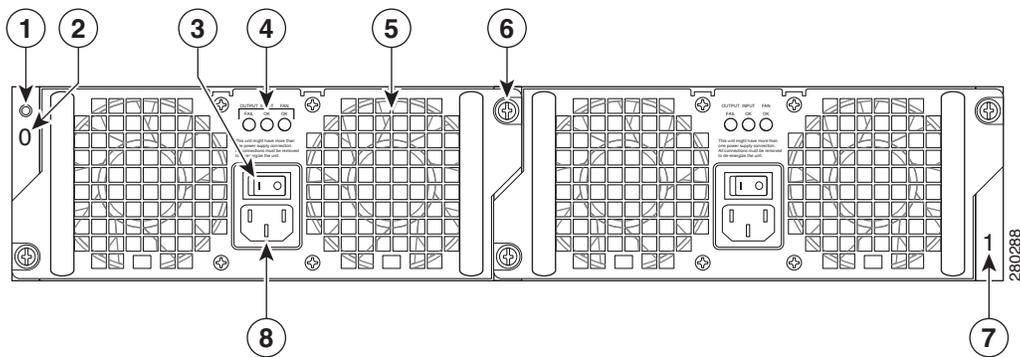
- [Connecting AC Power to the Cisco ASR 1002 Router, page 17](#)
- [Connecting -48V DC power to the Cisco ASR 1002 Router, page 18](#)
- [Connecting +24V DC Power to the Cisco ASR 1002 Router, page 22](#)

Read the safety warnings before you begin.

- 
Warning
Never install an AC power module and a DC power module in the same chassis. Statement 1050
- 
Warning
Installation of the equipment must comply with local and national electrical codes. Statement 1074
- 
Warning
When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046
- 
Warning
This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024
- 
Warning
This unit has two power supply connections. All connections must be removed to de-energize the unit. Statement 1028
- 
Warning
This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: AC power supplies for the Cisco Aggregation Services Routers: 120 VAC, 20A U.S. maximum. DC power supplies for the Cisco ASR 1006 Router: 50A U.S. maximum; Cisco ASR 1004 Router: 40A U.S. maximum: Cisco ASR 1002 Router: 30A (-48V) U.S. and 40A (+24V) U.S. maximum. Statement 1005

Figure 12 shows the AC power supply for the Cisco ASR 1002 Router.

Figure 12 AC Power Supply for the Cisco ASR 1002 Router



1	Chassis ESD socket	5	AC power supply fan
2	AC power supply slot number 0	6	AC power supply captive installation screw
3	AC power supply On (I) /Off (O) switch	7	AC power supply slot number 1
4	AC power supply LEDs	8	AC power inlet

Table 1 describes the AC power supply LEDs on the Cisco ASR 1002 Router.

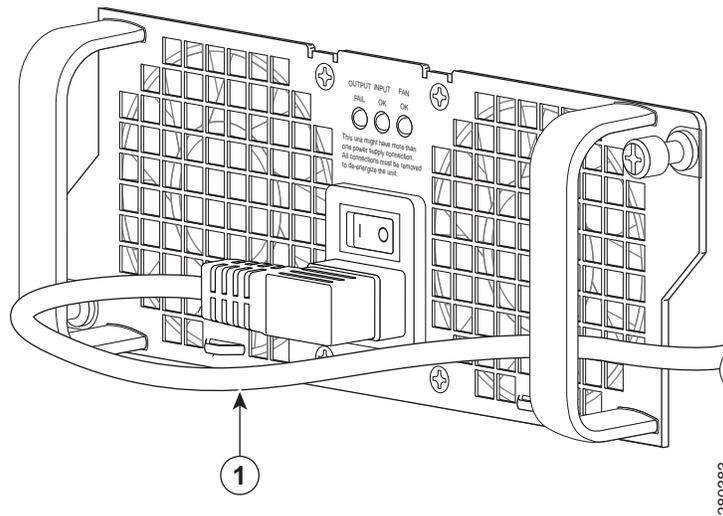
Table 1 Cisco ASR 1002 Router AC Power Supply LEDs

LED Label	LED	Color	Description
INPUT OK	Power supply activity	Green	The AC input voltage is greater than 85V.
		None	If the LED is not illuminated, then either the input voltage is less than 70V, or the power supply is turned off. If the AC input voltage is between 70V and 85V, the INPUT OK LED can be on, off, or flashing.
FAN OK	Power supply fan activity A bi-color LED indicates fan status.	Green	All fans are operational.
		Red	A fan failure is detected.
OUTPUT FAIL	Power supply activity	Red	If the INPUT OK LED is illuminated, this LED is red if the DC output voltages are below the minimum limit or above the maximum limit. If the INPUT OK LED is not illuminated, this LED might be off or red.
		Off	If the INPUT OK LED is illuminated, this LED is off if the DC output voltages are within the normal operating range. If the INPUT OK LED is not illuminated, this LED might be off or red.

Connecting AC Power to the Cisco ASR 1002 Router

- Step 1** Insert an AC power supply in power supply Slot 0 or power supply Slot 1 until it is full seated.
- Step 2** Tighten the captive installation screws.
- Step 3** At the rear of the router, check that the power switch is in the Off (O) position.
- Step 4** Insert the AC power cord into the power inlet and then turn it On (I).
- Step 5** To ensure that the AC power cord does not interfere with other cables or wires, dress the AC power cable in one of the following ways.
 - a. Leave a small service loop in the AC power cord from the inlet and then secure the power cord through the AC power supply handle as shown in [Figure 13](#). Or go to 5b.

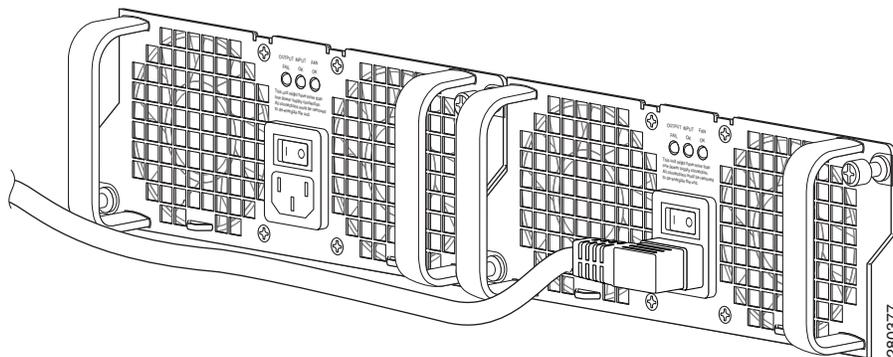
Figure 13 Cisco ASR 1002 Router AC Power Cord



1 AC power cord and service loop

- b. Take the power cord and run it below the handles of the power supply in slot 1 (the power supply you are connecting) and the power supply in slot 0 (left) as shown in [Figure 14](#). Make sure the power cord is hanging loosely so that it cannot be disconnected from the AC power inlet.

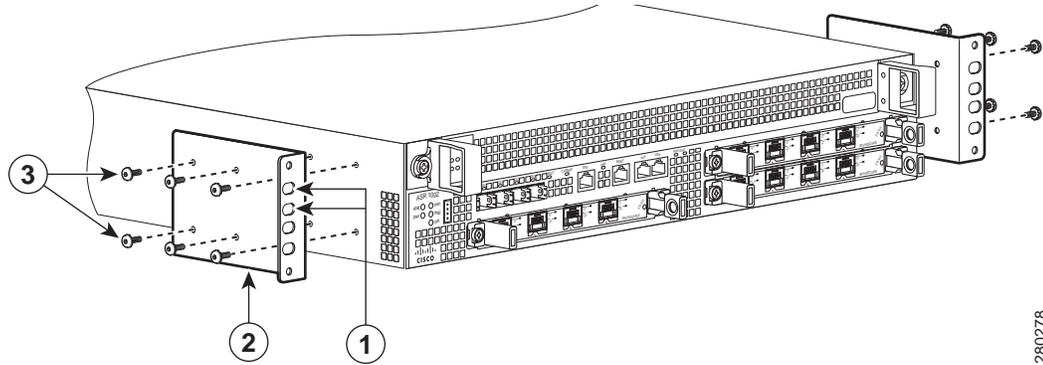
Figure 14 Cisco ASR 1002 Router AC Power Cord - Left and Right



Caution

Do not run the AC power cord through the power supply handles as shown in [Figure 15](#).

Figure 15 AC Power Supply Cord Cabling for the Cisco ASR 1002 Router



Note Using a tie wrap for the AC power cable is optional and not necessary. However, if you do attach the AC power cable to a power supply tab and then you remove the AC power cable for some reason, check for any damage to the cable after you cut the tie wrap off. If the power cord is damaged, replace it immediately.

Note Turn the power supply switch to On (I) after both sides of the power cord are connected.

- Step 6 Plug the AC power supply cable into the AC power source.
- Step 7 Place the AC power supply switch to the On (I) position.
- Step 8 The power supply LEDs light when power is supplied to the router.

This completes the procedure for connecting an AC power supply in the Cisco ASR 1002 Router. You have completed a live change-out procedure (that is, removing and replacing an AC power supply) for an AC power supply not operating properly in the Cisco ASR 1002 Router within five minutes.

Connect DC Power to the Cisco ASR 1002 Router

This section describes the Cisco ASR 1002 Router power supplies and how to connect them:

- [Connecting -48V DC power to the Cisco ASR 1002 Router, page 18](#)
- [Connecting +24V DC Power to the Cisco ASR 1002 Router, page 22](#)

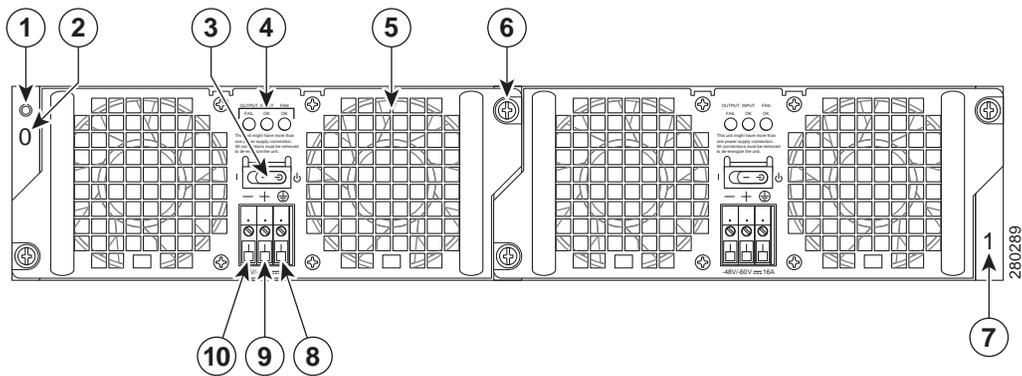
Connecting -48V DC power to the Cisco ASR 1002 Router

The -48V DC power supply input connector is a euro-style terminal block. A means to provide strain relief to the input wires is provided on the power supply. The connection order is negative (-), positive (+), and GND; but this is the order from left to right that the terminals appear on the power supply, not the order in which the leads should be connected during installation. The order the leads should be attached is GND, positive (+), and negative (-).

The recommended branch circuit breaker for the Cisco ASR 1002 Router -48V DC power supply is 30Amp. Use a AWG #10 wire gauge on the 30Amp circuit.

Figure 16 shows the -48V DC power supply for the Cisco ASR 1002 Router.

Figure 16 –48V DC Power Supply for the Cisco ASR 1002 Router



1	Chassis ESD socket	6	-48V DC power supply captive installation screw
2	-48V DC power supply slot 0 label	7	-48V DC power supply slot 1 label
3	-48V DC power supply switch Standby/On (I) (standby symbol is a broken circle with a vertical line through the top of it)	8	Negative ground lead
4	-48V Dopier supply LEDs	9	Positive ground lead
5	Fan	10	Earth ground lead

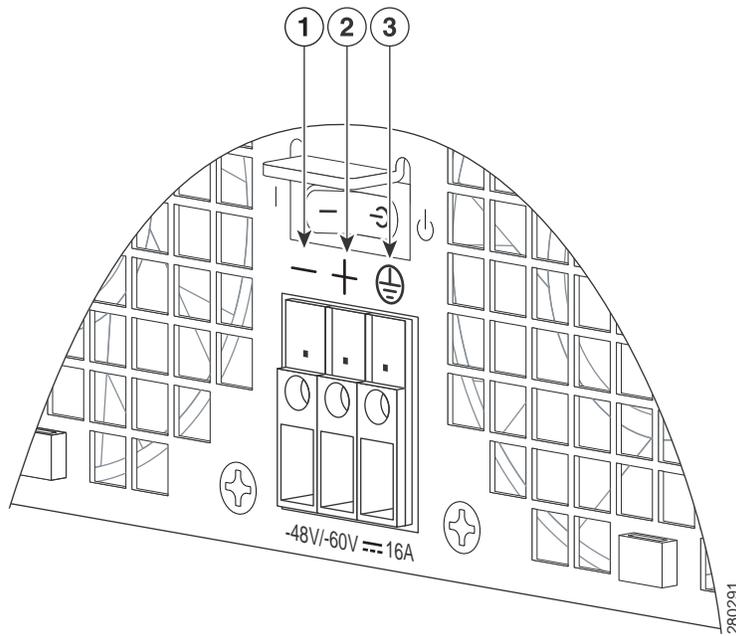
Table 2 describes the -48V DC power supply LEDs on the Cisco ASR 1002 Router.

Table 2 Cisco ASR 1002 Router -48V DC Power Supply LEDs

LED Label	LED	Color	Description
INPUT OK	A bi-color LED indicates presence of input voltage	Green	Signals that the DC power supply input voltage is greater than -43.5VDC at turn-on and remains green down to -39VDC.
		Amber	The power supply turns off due to low input voltage (falls below -39VDC) and indicates that there is still a voltage present (voltage on the terminal block). The LED remains amber and is active to around 20V +/-5V. The LED is not illuminated if the input is below 15V.
FAN OK	A bi-color LED indicates power supply fan status	Green	All fans are operational.
		Red	A fan failure is detected.
OUTPUT FAIL	Power supply activity	Red	It is off signals that the DC output voltage are within the normal operating range. Output voltage between the minimum and maximum limits will not create an output fail alarm, and output voltages below the minimum or above the maximum will create an Output Fail alarm. When you turn the power supply on, the red LED illuminates for two to three seconds to test LED operation before going off.

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.

Figure 17 Cisco ASR 1002 Router -48V DC Terminal Block



1	Negative lead	3	Earth ground symbol
2	Positive lead		

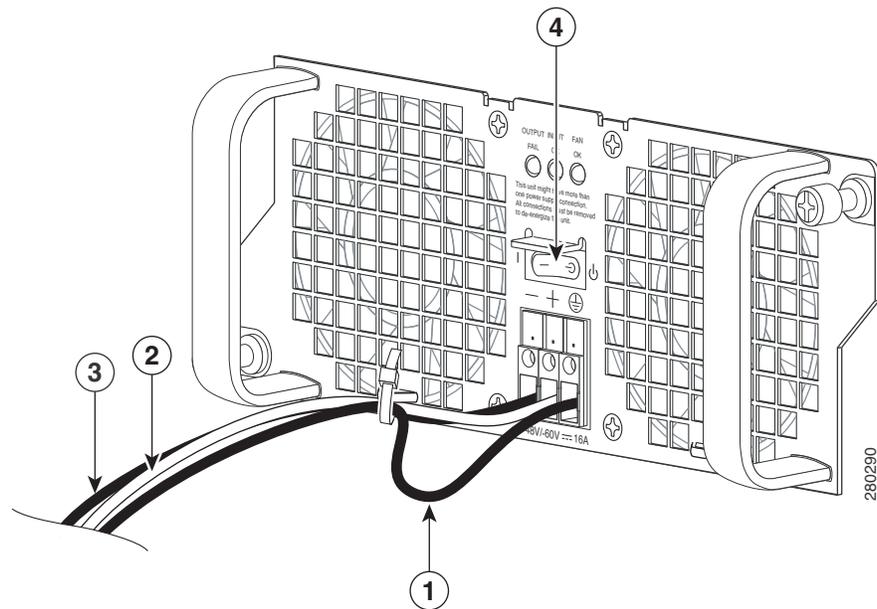
Warning  Never install an AC power module and a DC power module in the same chassis. Statement 1050

Warning  Installation of the equipment must comply with local and national electrical codes. Statement 1074

To connect

- Step 1** At the rear of the router, check that the power supply Standby switch is in the Standby position.
- Step 2** Ensure that the negative and positive leads are disconnected from the site power source and the circuit breaker is turned off.
- Step 3** Insert a -48V DC power supply in power supply slot 0 or power supply slot 1 until it is full seated.
- Step 4** Using a wire stripper, strip approximately 0.55 inch (14 mm) from the negative, positive, and ground lead.

Figure 18 Cisco ASR 1002 Router –48V DC Power Supply



1	Ground lead wire	3	Positive lead wire
2	Negative lead wire	4	DC power supply Standby switch

- Step 5** Insert the stripped end of the ground lead all the way into the ground lead receptacle on the –48V DC-input power supply, and tighten the receptacle screw using a 3.5 mm flat-blade screwdriver to a torque of 0.5 to 0.6Nm.
- Step 6** Insert the stripped end of the positive lead all the way into the positive lead receptacle and tighten the receptacle screw using the same 3.5 mm flat-blade screwdriver. Repeat this step for the negative lead.

Note Make sure the entire stripped end of each lead is inserted all the way into its receptacle. If any exposed wire at the stripped end of a lead is visible after inserting the lead into its receptacle, remove the lead from the receptacle, use the wire stripper to cut the stripped end of the lead, and repeat Step 4 through Step 6.

- Step 7** After tightening the receptacle screw for the ground, positive, and negative DC-input leads, use a cable tie to secure the three leads to the power supply faceplate.

Note When securing the ground, positive, and negative DC-input leads to the power supply faceplate, leave extra service loop in the ground lead to ensure that the ground lead is the last lead to disconnect from the power supply if a great deal of strain is placed on all three leads.

- Step 8** Turn the branch circuit breaker on at your site and the turn the Standby switch to the On (I) position.
- Step 9** Check that the power supply LEDs light when power is supplied to the router.

You have completed the procedure for connecting a –48V DC power supply in the Cisco ASR 1002 Router.

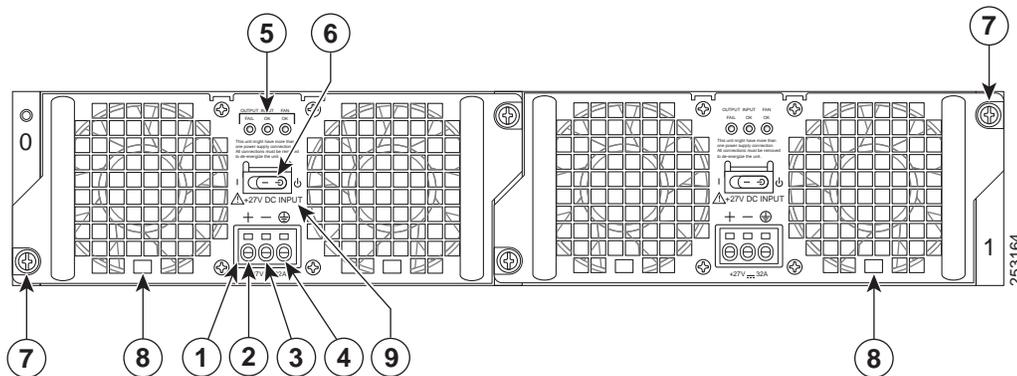
Connecting +24V DC Power to the Cisco ASR 1002 Router

The +24V DC power supply uses a spring-loaded terminal block. The input terminal block requires 8 AWG multi-strand wiring to support input current. Features are provided for strain relieving the input wires from the terminal block on the front panel. The recommended branch circuit breaker for the Cisco ASR 1002 Router +24V DC power supply is a 40Amp UL listed circuit breaker.

Before you begin, read these important notices about the +24V DC power supply:

- The labeling displays +27V DC INPUT. This labeling describes the nominal voltage provided at a cell site.
- Observe the polarity location—Unlike the polarity labels of the -48V DC power supply (ground, positive, negative), the polarity labels on the +24V DC are ground, negative, positive as shown in Figure 19 from right to left as they appear on the actual power supply unit.
- The ground (GND) lead is always installed first and removed last.
- The +24V DC power supply uses a spring loaded terminal block; therefore have the recommended screwdriver size available.
- Review the diagrams to see how the wire is stripped and how the screwdriver is inserted at an angle into the terminal block.
- Have the following equipment available to install and remove the +24V DC power supply:
 - Phoenix-Contact 3.5mm flat-blade screwdriver or equivalent
 - Wire-stripping tool for stripping 8-gauge wire

Figure 19 Cisco ASR 1002 Router +24V DC Power Supply Components



1	+24V DC terminal block	6	Standby/On switch
2	Positive (+) lead	7	Captive fastener
3	Negative (-) lead	8	Power supply tabs
4	Earth ground (GND) lead	9	+27V DC INPUT label
5	Power supply LEDs		

Note The color coding of the +24V DC-input power supply leads depends on the color coding of the +24V DC power source at your site. Typically, green or green/yellow is used for ground. Make certain the lead color coding you choose for the +24V DC-input power supply matches lead color coding used at the +24V DC power source. Most commonly used wire color-coding is red for positive (+) lead and black for negative (-) lead.

Warning When you install the unit, the ground connection must always be made first and disconnected last. Statement 1046

To connect +24V DC power supply in the Cisco ASR 1002 Router, follow these steps:

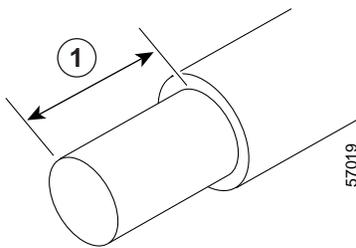
- Step 1** At the rear of the router, check that the power Standby switch is in the Standby position.
- Step 2** Ensure that the positive and negative leads are disconnected from the site power source and the source circuit breaker is turned off.
- Step 3** Using a wire stripper, strip the recommended amount of wire insulation which is 15mm (0.6 inch) from the ground, negative, and positive leads.



Note The stripping length is common to all types of wire used.

Figure 20 shows the wire lead and insulation area.

Figure 20 Cisco ASR 1002 Router +24V DC Power Supply Wire and Insulation



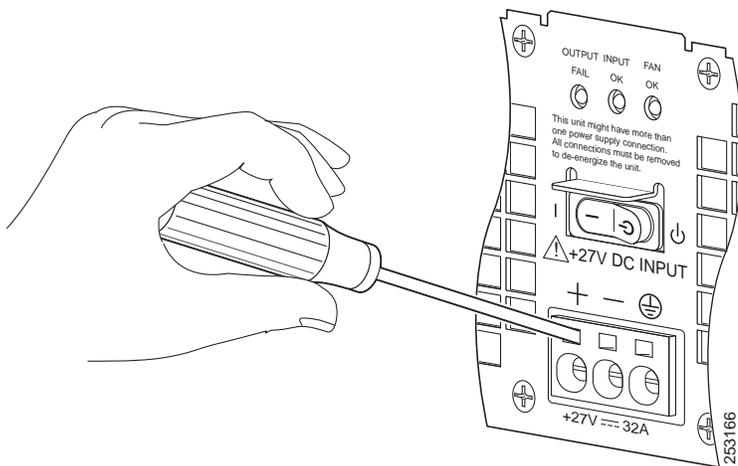
1	+24V DC wire with insulation		
---	------------------------------	--	--



Note Make sure the stripped end of each lead wire is twisted tightly together. This makes insertion easier. Then make certain the entire lead wire is inserted all the way into its receptacle. If any exposed wire at the stripped end of a lead is visible after inserting the lead into its receptacle, remove the lead from the receptacle, use the wire stripper to cut the stripped end of the lead, and then reinsert.

- Step 4** Using a 3.5mm screwdriver, insert the screwdriver at an angle to release the spring while you install the stripped lead wire (see Figure 21).

Figure 21 Inserting a Screwdriver into the Cisco ASR 1002 Router +24V DC Power Supply Terminal Block



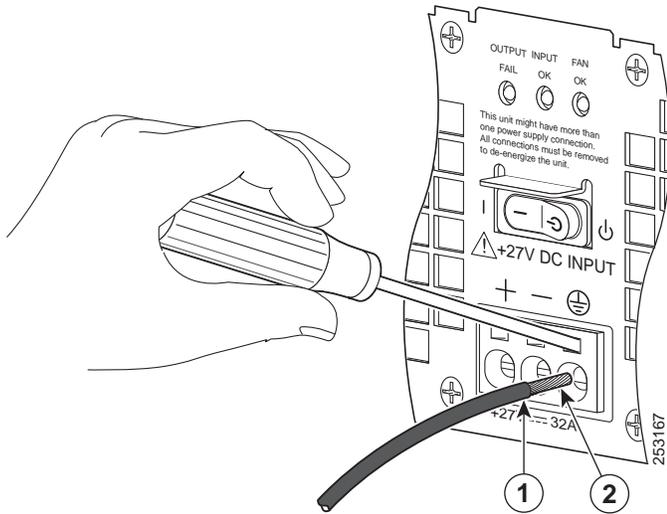
- Step 5** Carefully push the screwdriver at an angle forward until you relieve the spring contact.

Step 6 With the screwdriver still inserted, gently push the lead wire (ground lead first) in until it is fully inserted as shown in [Figure 22](#).

 **Caution** Check that there is no copper portion of the lead wire exposed. You only want the wire insulation visible.

 **Caution** Do not install wire into the terminal block that has not had its insulation removed.

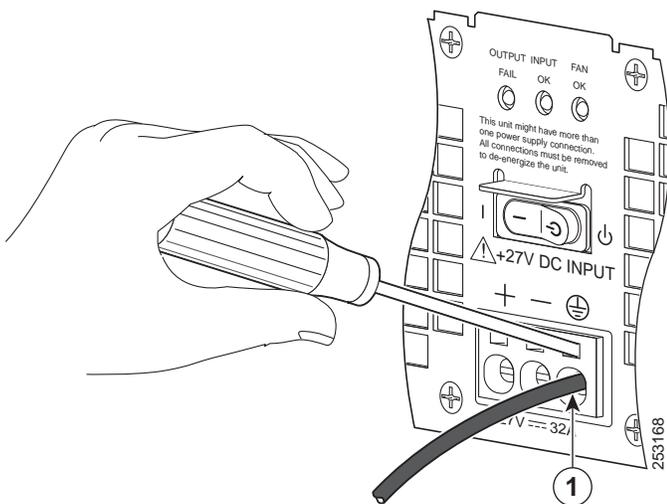
Figure 22 Cisco ASR 1002 Router +24V DC Power Supply Lead Wire Inserted into Terminal Block



1	Lead wire insulation	2	Stripped copper wire
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[Figure 23](#) shows the wire lead fully inserted into the terminal block.

Figure 23 Cisco ASR 1002 Router +24V DC Power Supply Fully-Inserted lead Wire



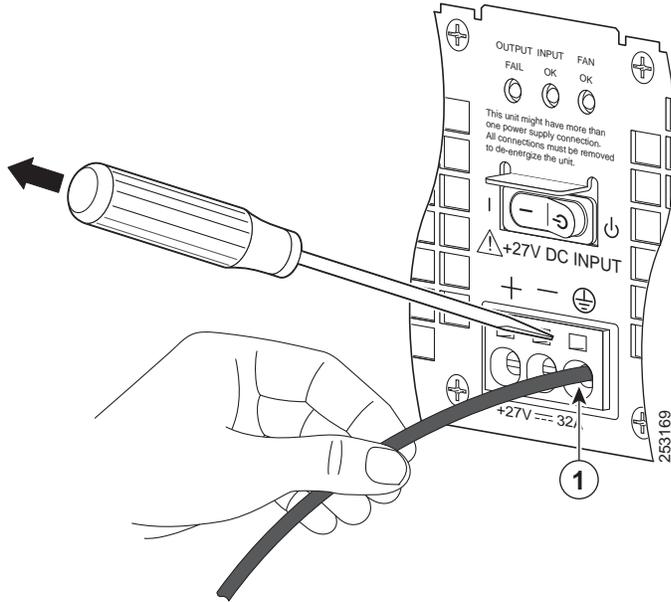
1	Ground lead wire		
---	------------------	--	--

Step 7 After the lead wire is fully inserted, hold the lead wire in place by pressing inward while you remove the screwdriver to release the spring to tension down on the installed lead wire.

Step 8 Once the screwdriver is completely removed, gently pull on the lead wire to make certain that the lead wire is securely installed.

Figure 24 shows a lead wire fully inserted and the screwdriver removed while you gently pull on the lead to make certain it is secured in the terminal block.

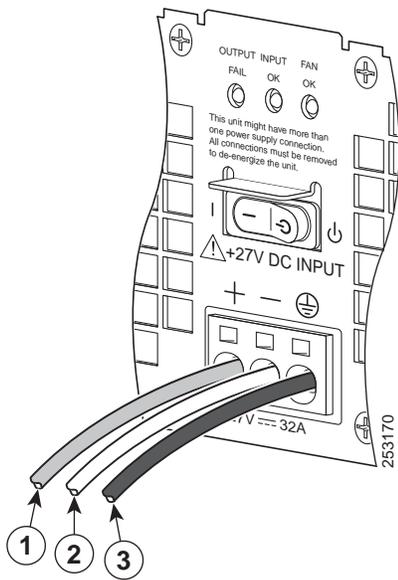
Figure 24 Removing the Screwdriver from the Cisco ASR 1002 Router +24V DC Power Supply



1	+24V DC lead ground wire		
---	--------------------------	--	--

Step 9 Repeat Steps 5 through Step 8 for each lead wire. **Figure 25** shows the leads wires installed in the terminal block.

Figure 25 Cisco ASR 1002 Router +24V DC Power Supply Lead Wires Installed

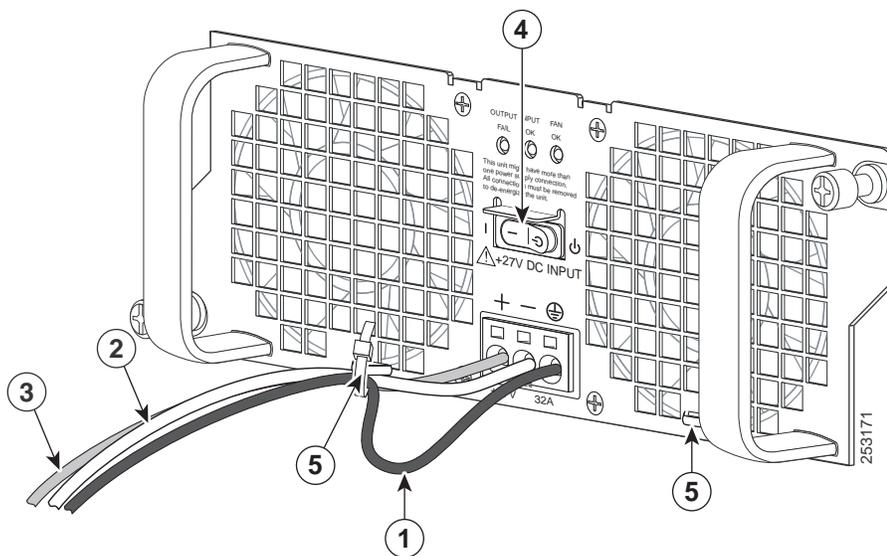


1	Positive lead wire (usually red)	3	Ground (GND) lead wire (green/yellow)
2	Negative lead wire (black)		

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground (GND), black is used for -48V on negative (-) terminal and red is used for RTN on the positive (+) terminal. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.

Step 10 After inserting the ground wire leave an extra service loop in the ground lead to ensure that the ground lead is the last lead to disconnect from the power supply if a great deal of strain is placed on all three leads. Use a cable tie wrap to secure the three leads to the power supply faceplate. There are tabs on the power supply to use for the tie wraps as shown in [Figure 26](#).

Figure 26 Cisco +24V DC Power Supply Terminal Block Ground Lead Service Loop



1	Earth ground lead wire with service loop	4	+24V DC power supply Standby switch
2	Negative lead wire	5	Power supply tabs
3	Positive lead wire		



Caution

When securing the ground, positive, and negative +24V DC-input leads to the power supply faceplate, leave extra service loop in the ground (GND) lead to ensure that the ground lead is the last lead wire to disconnect from the power supply if a great deal of strain is placed on all three leads.

- Step 11** After tightening the receptacle screw for the ground, and leaving the extra service loop in the ground lead, use a cable tie to secure the three leads to the power supply faceplate tie-wrap tab as shown in.
- Step 12** Turn on the branch source breaker. The following LEDs light up: OUTPUT FAIL is red, INPUT OK should be green, and FAN OK is off.
- Step 13** Place the power supply standby switch to the On (I) position. The power supply LEDs light when power is supplied to the router. The following LEDs light up: OUTPUT FAIL is off, INPUT OK is green, and FAN OK is green.

This completes the steps for connecting the +24V DC power supply in the Cisco ASR 1002 Router.

Verifying Power Supply operation

Follow this procedure to verify power supply is operating correctly.

- Step 1** Check that the power supply LEDs are:
 - INPUT OK is green
 - FAN OK is green
 - OUTPUT FAILED is not illuminated
- Step 2** To ensure that the power supply state is OK, type the **show platform** command. This output sample is from a Cisco ASR1002 router. The other Cisco ASR1000 routers display similar type of output.

```
MCP_SCAL_R1#sho plat
Chassis type: ASR1002
```

The following output displays:

```
Slot    Type                State      Insert Time
1       ASR1000-SIP10       ok        00:03:19
1/1    SPA-8X1GE-V2       ok        00:02:23
2       ASR1000-SIP10       ok        00:03:19
2/0    SPA-1X10GE-L-V2    ok        00:02:22
2/1    SPA-8X1GE-V2       ok        00:02:17
R0     ASR1000-RP1        ok,active 00:03:19
F0     ASR1000-ESP10      ok,active 00:03:19
P0     ASR1002-PWR-AC     ok        00:02:50
P1     ASR1002-PWR-AC     ps, fail  00:02:50
```

```
Slot    CPLD Version      Firmware
Version
1       07091401         12.2(33r)XN2
2       07091401         12.2(33r)XN2
R0     08060301         12.2(0:0)
F0     08041102         12.2(33r)XN2
```

```
MCP_SCAL_R1#
```

If the LEDs indicate a power problem or the power supply state is ps,fail, then contact a customer service representatives for assistance or additional instructions.

Start the Cisco ASR 1002 Router

After installing your Cisco ASR 1002 Router and connecting cables, start the router as follows.

Check the following conditions before you start the Cisco ASR 1002 Router:

- The Cisco ASR 1002 Router has one slot for FP0 with three subslots for SPAs, subslots 1, 2, and 3. Make certain that each shared port adapter is firmly seated in its subslot and its captive screws are securely tightened.
- The Cisco ASR1000-ESP5 or ASR1000-ESP10 forwarding processor in the Cisco ASR 1002 router is inserted in slot F0, is firmly seated in its slot, and its captive screws are securely tightened.
- All network interface cables are connected.
- The console terminal is turned on.

Step 1 Turn on power. The green OK LED on the power supply turns on. (Both power supplies are required in the Cisco ASR 1002 Router.)

Step 2 Listen for the fans; you should immediately hear them operating.

Step 3 During the boot process, observe the system LEDs. The power LED should be green. The STATUS LED lights yellow to indicate booting and then green when Cisco IOS is running.

Table 3 provides information about the LEDs as the system starts.

Table 3 Cisco ASR 1002 Router LED Activity

LED Label	LED	Color	In the Power Up State -Behavior Description
PWR	Power	Solid green	All power requirements are within specification.
		Off	The router is in standby mode.

LED Label	LED	Color	In the Power Up State -Behavior Description
STAT	System status	Solid green	Cisco IOS has successfully booted.
		Yellow	BOOT ROM has successfully loaded.
		Red	System failure.
CRIT	Critical	Solid red	Critical alarm indicator. On at power up
MAJ	Major	Solid red	Major alarm indicator.
MIN	Minor	Amber	Minor alarm indicator.
LINK	10/100/1000 RJ-45	Flashing green	Link activity indicator.
		Off	No link.
		Solid green	Link with no activity.
BOOT	eUSB FLASH BOOT (BootDisk)	Flashing green	Activity indicator.
		Off	No activity.
CARRIER	BITS	Green	In frame and working properly.
		Off	Out of service or not configured.
		Amber	Fault or loop condition.
**Built-in 4xGE SPA SFP Port Status	4 LEDs total, one for each SFP	Off	Port is not enabled.
		Amber	Port enabled. Problem with the Ethernet link.
		Green	Port enabled and the Ethernet link is valid.
CC - PWR	Embedded SIP power rail status	Green	If all power supplies within their tolerance specifications.
CC - STAT	Embedded SIP current status	Green	Green only when the SPA drivers have started and are running and all critical processes are running.
		Yellow	ROMMON is running and during the download and boot.
		Red	A fault is detected or the card is powering up.

**For more information about the small form-factor pluggable (SFP) transceiver modules that are compatible with Cisco ASR 1002 Built-in Gigabit Ethernet Ports (4x1GE), refer to the Modular Optics Compatibility section in the [Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Hardware Installation Guide](#).

Table 4 provides information about the Cisco ASR1000-ESP5 LEDs in the Cisco ASR 1002 Router as the system starts.

Table 4 Cisco ASR1000-ESP5 and ASR1000-ESP10 LED Activity

LED Label	LED	Color	Behavior Description
PWR	Power	Solid green	All power supplies are within operational limits.
		Off	The router is in standby mode.
STAT	Status	Green	Code has successfully downloaded and is operational.
		Yellow	BOOT ROM has successfully loaded.
		Red	Not booted.
ACTV	Active	Green	The embedded services processor is green when active.
STBY	Standby	None	Will always be off.

During the boot process, observe the system LEDs. The STATUS LED comes on immediately as amber, then turns to green when the Cisco IOS is booted.

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A summary of U.S. laws governing Cisco cryptographic products may be found at:
<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to export@cisco.com.

cisco ASR1000 (RP1) processor with 753956K/6147K bytes of memory.
2 Packet over SONET interfaces
32768K bytes of non-volatile configuration memory.
1862368K bytes of physical memory.
439807K bytes of eUSB flash at bootflash:.
39004543K bytes of SATA hard disk at harddisk:.
1020584K bytes of USB flash at usb0:.

no ip http secure-server

% Invalid input detected at '^' marker.

SETUP: new interface POS0/1/0 placed in "shutdown" state
SETUP: new interface POS0/1/1 placed in "shutdown" state

Press RETURN to get started!

*Feb 13 13:01:28.579: %FMANRP-6-IPCSTATUS: IPC Channel BIPC is up
*Feb 13 13:01:28.649: %FMANFP-6-IPCSTATUS: IPC Channel stats-BIPC is up
*Feb 13 13:01:28.649: %FMANFP-6-IPCSTATUS: IPC Channel crypto-BIPC is up
*Feb 13 13:01:28.656: %NETCLK-5-NETCLK_MODE_CHANGE: Network clock source not available. The network clock has changed to freerun

*Feb 13 13:01:28.701: %LINK-5-CHANGED: Interface GigabitEthernet0, changed state to administratively down
*Feb 13 13:01:29.728: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0, changed state to down
*Feb 13 13:01:14.738: %CPPHA-7-SYSREADY: F0: cpp_ha: CPP client process FMAN-FP (5 of 5) ready.
*Feb 13 13:01:14.895: %IOSXE-6-PLATFORM: F0: cpp_cp: cpp_mlp_svr_client_bind: cpp_mlp_svr_ifm_init() successful
*Feb 13 13:01:15.016: %CPPHA-7-START: F0: cpp_ha: CPP 0 preparing image /usr/cpp/bin/cpp-mcplo-ucode
*Feb 13 13:01:15.756: %CPPHA-7-START: F0: cpp_ha: CPP 0 startup init image /usr/cpp/bin/cpp-mcplo-ucode
*Feb 13 13:01:25.217: %CPPHA-7-START: F0: cpp_ha: CPP 0 running init image /usr/cpp/bin/cpp-mcplo-ucode
*Feb 13 13:01:25.473: %CPPHA-7-READY: F0: cpp_ha: CPP 0 loading and initialization complete
*Feb 13 13:01:25.473: %CPPHA-6-SYSINIT: F0: cpp_ha: CPP HA system configuration start.
*Feb 13 13:01:26.752: %IOSXE-6-PLATFORM: F0: cpp_cp: Process CPP_PFILTER_EA_EVENT_API_CALL_REGISTER
*Feb 13 13:01:26.913: %CPPHA-6-SYSINIT: F0: cpp_ha: CPP HA system enabled.
*Feb 13 13:01:26.920: %CPPHA-6-SYSINIT: F0: cpp_ha: CPP HA system initializaton complete.
*Feb 13 13:01:33.990: %SYS-5-CONFIG_I: Configured from memory by console
*Feb 13 13:01:33.999: %ASR1000_OIR-2-REMSPA: SPA removed from subslot 0/1, interfaces disabled
*Feb 13 13:01:33.999: %ASR1000_OIR-2-REMSPA: SPA removed from subslot 0/2, interfaces disabled
*Feb 13 13:01:34.002: %ASR1000_OIR-2-INSCARD: Card (fp) inserted in slot F0
*Feb 13 13:01:34.002: %ASR1000_OIR-2-ONLINECARD: Card (fp) online in slot F0
*Feb 13 13:01:34.029: %ASR1000_OIR-2-INSCARD: Card (cc) inserted in slot 0
*Feb 13 13:01:34.029: %ASR1000_OIR-2-ONLINECARD: Card (cc) online in slot 0
*Feb 13 13:01:34.030: %ASR1000_OIR-2-INSSPA: SPA inserted in subslot 0/1
*Feb 13 13:01:34.034: %ASR1000_OIR-2-INSSPA: SPA inserted in subslot 0/2
*Feb 13 13:01:34.370: %SYS-5-RESTART: System restarted --
Cisco IOS Software, IOS-XE Software (PPC_LINUX_IOSD-ADVENTERPRISEK9-M), Version 12.2(33)XNA, RELEASE SOFTWARE
Technical Support: <http://www.cisco.com/techsupport>

```
Copyright (c) 1986-2008 by Cisco Systems, Inc.
Compiled Thu 01-May-08 00:29 by mcpre*Feb 13 13:01:36.253: %DYNCMD-7-CMDSET_LOADED: The Dynamic Command
set has been loaded from the Shell Manager
*Feb 13 13:01:36.326: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
Router>
```



Note You have the option of proceeding with the **setup** command facility to configure the interfaces or exiting from setup and using configuration commands to configure global (system-wide) and interface-specific parameters. You do not have to configure the interfaces immediately; however, you cannot enable the interfaces or connect them to any networks until you have configured them. For detailed software configuration information, see the [Cisco ASR 1000 series Aggregation Services Routers Software Configuration Guide](#).

6 Configuring the Router

Use this section for information on configuring the Cisco ASR 1002 Router.

Using the Console to Access the CLI

To access the command-line interface using the console, follow these steps:

Your system is booting and if you answer No, at the prompt:

```
--- System Configuration Dialog ---
```

```
Would you like to enter the initial configuration dialog? [yes/no]: no
```

Step 1 Press **Return** to enter user EXEC mode. The following prompt appears:

```
Router>
```

Step 2 From user EXEC configuration mode, enter the **enable** command as shown in the following example:

```
Router> enable
```

Step 3 At the password prompt, enter your system password. If an enable password has not been set on your system, this step may be skipped. The following example shows entry of the password called *enablepass*:

```
Password: enablepass
```

Step 4 When your enable password is accepted, the privileged EXEC configuration mode prompt appears:

```
Router#
```

Step 5 You now have access to the CLI in privileged EXEC mode and you can enter the necessary commands to complete your desired tasks.

Step 6 To exit the console session, enter the **quit** command as shown in the following example:

```
Router# quit
```

Configure Global Parameters Using the Set-up Facility

When you first start the setup program, you must configure the global parameters. These parameters are used for controlling system-wide settings. Complete the following steps to enter global parameters:

Step 1 Connect a console terminal to the console port. This is only an example of the output display; prompts may vary. When you see this information, you have successfully booted your router:

Restricted Rights Legend

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cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: yes

Press RETURN to get started!

Step 2 The first sections of the configuration script appear only at an initial system startup. On subsequent uses of the setup facility, the script begins with a System Configuration Dialog as shown in the following example:

Step 3 When asked if you would like to enter the initial configuration dialog, enter **yes**.

Would you like to enter the initial configuration dialog? [yes/no] **yes**

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Basic management setup configures only enough connectivity for management of the system, extended setup will ask you to configure each interface on the system.

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: y

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Basic management setup configures only enough connectivity for management of the system, extended setup will ask you to configure each interface on the system

Would you like to enter basic management setup? [yes/no]: n

First, would you like to see the current interface summary? [yes]: y

Any interface listed with OK? value "NO" does not have a valid configuration

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0/0	unassigned	NO	unset	down	down
GigabitEthernet0/0/1	unassigned	NO	unset	down	down
GigabitEthernet0/0/2	unassigned	NO	unset	down	down
GigabitEthernet0/0/3	unassigned	NO	unset	down	down
GigabitEthernet0	unassigned	YES	unset	administratively down	down

Configuring global parameters:

Enter host name [Router]:

The enable secret is a password used to protect access to privileged EXEC and configuration modes. This password, after entered, becomes encrypted in the configuration.

Enter enable secret: test

The enable password is used when you do not specify an

enable secret password, with some older software versions, and some boot images.

Enter enable password: tests

The virtual terminal password is used to protect access to the router over a network interface.

Enter virtual terminal password: test

Configure SNMP Network Management? [yes]: n

Configure IP? [yes]: y

Configure RIP routing? [no]:

Configure bridging? [no]:

Configure CLNS? [no]:

Configuring interface parameters:

Do you want to configure GigabitEthernet0/0/0 interface? [yes]: n

Do you want to configure GigabitEthernet0/0/1 interface? [yes]: n

Do you want to configure GigabitEthernet0/0/2 interface? [yes]: n

Do you want to configure GigabitEthernet0/0/3 interface? [yes]: n

Do you want to configure GigabitEthernet0 interface? [no]: n

The following configuration command script was created:

```
hostname Router
enable secret 5 $1$6r./$U5wHcV3uRWkKWK/fap474.
enable password tests
line vty 0 4
password test
no snmp-server
!
ip routing
no bridge 1
no clns routing
!
interface GigabitEthernet0/0/0
shutdown
no ip address
!

interface GigabitEthernet0/0/1
shutdown
no ip address
!
interface GigabitEthernet0/0/2
shutdown
no ip address
!
interface GigabitEthernet0/0/3
shutdown
no ip address
!
interface GigabitEthernet0/1/0
shutdown
no ip address
!
interface GigabitEthernet0/1/1
shutdown
no ip address
!
interface FastEthernet0/3/0
shutdown
no ip address
!
```

```
interface FastEthernet0/3/1
shutdown
no ip address
!
interface FastEthernet0/3/2
shutdown
no ip address
!
interface FastEthernet0/3/3
shutdown
no ip address
!
interface FastEthernet0/3/4
shutdown
no ip address
!
interface FastEthernet0/3/5
shutdown
no ip address
!
interface FastEthernet0/3/6
shutdown
no ip address
!
interface FastEthernet0/3/7
shutdown
no ip address
!
interface GigabitEthernet0
shutdown
no ip address
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
!
end
```

[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]:

```
Router#reload
Proceed with reload? [confirm]
```

*Jan 11 06:59:29.476: %SYS-5-RELOAD: Reload requested by console. Reload Reason: Reload command.

System Bootstrap, Version 12.2(20071105:235056) [gschnorr-mcp_rommon_rel_1_25 101], DEVELOPMENT SOFTWARE
Copyright (c) 1994-2007 by cisco Systems, Inc.
Compiled Mon 05-Nov-07 16:50 by gschnorr-mcp_rommon_rel_1_25

Current image running: Boot ROM1
Last reset cause: LocalSoft
SATA drive PCI config error

ASR1000-RP1 platform with 2097152 Kbytes of main memory

rommon 1 > b tftp:images/packages_crypto/asr1000rp1-advipservicesk9.mcp_dev_20080109_101550.bin

```
IP_ADDRESS: 2.1.6.5
IP_SUBNET_MASK: 255.255.0.0
DEFAULT_GATEWAY: 2.1.0.1
TFTP_SERVER: 2.0.0.2
TFTP_FILE: images/packages_crypto/asr1000rp1-advipservicesk9.mcp_dev_20080109_101550.bin
```

```
Using midplane macaddr
  TFTP_MACADDR: 00:14:a8:ff:42:ff
  TFTP_VERBOSE: Progress
  TFTP_RETRY_COUNT: 18
  TFTP_TIMEOUT: 7200
  TFTP_CHECKSUM: Yes
  ETHER_PORT: 3
  ETHER_SPEED_MODE: Auto Detect
link up 1000Mbps/FD.....
Receiving images/packages_crypto/asr1000rp1-adviservicesk9.mcp_dev_20080109_101550.bin from 2.0.0.2
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

```
File reception completed.
Boot image size = 206741708 (0xc52a0cc) bytes
```

```
Using midplane macaddr
Package header rev 0 structure detected
Calculating SHA-1 hash...done
validate_package: SHA-1 hash:
  calculated a8301e1e:17821e94:07654c49:4ca6fe49:518af2c2
  expected a8301e1e:17821e94:07654c49:4ca6fe49:518af2c2
Image validated
```

```
PPC/IOS XE loader version: 0.0.3
loaded at: 00800000 OCD2C004
zimage at: 00807673 009B8E53
initrd at: 009B9000 01006E53
isord at: 01007000 OCD2A000
avail ram: 00400000 00800000
```

```
Kernel load:
Uncompressing image... dst: 00000000 lim: 00400000 start: 00807673 size: 001B17E0...done.
Now booting the IOS XE kernel
```

```
%IOSXEBOOT-4-BOOT_PARAMETER: (rp/0): Booting with custom BOOT_PARAM setting
%IOSXEBOOT-4-DEBUG_CONF: (rp/0): File /misc/scratch/debug.conf is absent, ignoring
```

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Cisco IOS Software, IOS-XE Software (PPC_LINUX_IOSD-ADVENTERPRISEK9-M), Version 12.2(33)XNA, RELEASE SOFTWARE
Technical Support: <http://www.cisco.com/techsupport>
Copyright (c) 1986-2008 by Cisco Systems, Inc.
Compiled Thu 01-May-08 00:29 by mcpre
Image text-base: 0x10062810, data-base: 0x132AED48

A summary of U.S. laws governing Cisco cryptographic products may be found at:
<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to export@cisco.com.

cisco ASR1000 (RP1) processor with 548011K/6147K bytes of memory.
8 FastEthernet interfaces

```
6 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
2097152K bytes of physical memory.
947711K bytes of eUSB flash at bootflash:.
253407K bytes of USB flash at usb0:.
    --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: n
```



Note Basic management setup configures enough connectivity for managing the system; extended setup will ask you to configure each interface on the system. For detailed information about setting global parameters, refer to the *Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide*.

Check the Running Configuration Settings

To check the value of the settings you have entered, enter the **show running-config** command at the `Router#` prompt:

```
Router# show running-config
```

To review changes you make to the configuration, use the EXEC mode **show startup-config** command to see the changes and **copy run-start** command stored in NVRAM.

Save the Running Configuration to NVRAM

To store the configuration or changes to your startup configuration in NVRAM, use the `copy running-config startup-config` command to save your configuration changes to the startup configuration so that the changes will not be lost if the software reloads or a power outage occurs. For example:

```
Router# copy running-config startup-config
Building configuration...
```

It might take a minute or two to save the configuration. After the configuration has been saved, the following output appears:

```
[OK]
Router#
```

This task saves the configuration to NVRAM.

To review changes you make to the configuration, use the EXEC mode **show startup-config** command to see the changes and **copy run-start** command stored in NVRAM.



Note Using the **copy run-start** command saves the configuration settings that you created in the router using configuration mode and the setup facility. If you fail to do this, your configuration will be lost the next time you reload the router.

Perform Other Configuration Tasks

To make advanced configuration changes after you establish the basic startup configuration for your router, refer to the *Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide* and modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware. These publications contain additional information on using the **configure** command. The configuration publications also provide information about the following tasks:

- Understanding command modes
- Booting and rebooting the router

- Understanding software packages and architecture for the Cisco ASR 1002 Router
- Software Upgrades

7 After Installation

Follow the instructions in this section to replace field-replaceable units (FRUs) after installation. The Cisco ASR 1002 Router supports the following components as FRUs: Cisco ASR1000-ESP5, shared port adapters, and power supplies.



Note For a complete list of Cisco ASR 1000 Series Routers field replaceable units, see [Cisco ASR 1000 Series Aggregation Services Routers Hardware Installation Guide](#).

The following topics are covered in this section:

- [Powering Off the Cisco ASR 1002 Router Safely](#), page 38
- [Replace the Cisco ASR1000-ESP5 or ASR1000-ESP10](#), page 39
- [Replace the Shared Port Adapters](#), page 39
- [Replace a Power Supply in the Cisco ASR 1002 Router](#), page 40



Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
Statement 1030

Powering Off the Cisco ASR 1002 Router Safely

This section explains how to shut down the Cisco ASR 1002 Router. It is recommended that before turning off all power to the chassis, you issue the **reload** command. This insures that the operating system cleans up all the file systems. Once the reload operation is complete, then the Cisco ASR 1002 Router can be powered off safely.

To remove power from a Cisco ASR 1002 Router safely, follow this procedure and see the examples:

Step 1 Slip on the ESD-preventive wrist strap that was included in the accessory kit.

Step 2 Enter the **reload** command.

Step 3 Confirm the reload command:

```
Rmcp-2ru-1#reload
Proceed with reload? [confirm]
Aug 17 00:06:47.051 R0/0: %PMAN-5-EXITACTION: Process manager is exiting: prs exit with reload chassis code
```

Step 4 After confirming the reload command, wait until the system bootstrap message displays before powering off the system.

```
System Bootstrap, Version 12.2(33r)XN2, RELEASE SOFTWARE (fc1)
Technical Support: tap://www.cisco.com/techsupport
Copyright (c) 2010 by cisco Systems, Inc.
```

```
Current image running: Boot ROM0
Last reset cause: LocalSoft
```

```
ASR1000-RP1 platform with 4194303 Kbytes of main memory
```

```
mcp-2ru-1-rp0-rommon 1>
```

Step 5 Remove any power cables from the Cisco ASR 1002 Router.

- For power supplies with a circuit breaker switch, position the switch to the Off (O) position.
- For power supplies with a Standby switch, place the Standby switch in the Standby position.



Note After powering off the router, wait a minimum of 30 seconds before powering it on again.

Replace the Cisco ASR1000-ESP5 or ASR1000-ESP10

This section provides instructions for removing the Cisco ASR1000-ESP5 or ASR1000-ESP10 from the Cisco ASR 1002 Router. The Cisco ESP5 and ESP10 are Cisco Quantum Flow Processors (QFP) for the Cisco ASR 1002 Router. The Cisco ESP5 and ESP10 are individual FRUs and support online insertion and removal operation. Before you begin, make certain the chassis is grounded.

To remove the Cisco ESP5 or ESP10 from the Cisco ASR 1002 Router, follow this procedure:

-
- Step 1** Slip on the ESD-preventive wrist strap that was included in the accessory kit. Loosen the captive screws on the Cisco ESP5 or ESP10.
- Step 2** Using the handles on both sides of the module, with two hands, gently slide the Cisco ESP5 or ESP10 out of the chassis slot.



Note Handle the Cisco ESP5 and ESP10 by the carrier edges only; never touch the printed circuit board components or connector pins.

- Step 3** Place the Cisco ESP5 or the ESP10 on an antistatic surface with its printed circuit board components facing upward or in a static shielding bag.
-

You have completed the procedure for removing the Cisco ESP5 or ESP10.

To install the Cisco ESP5 or ESP10 in the Cisco ASR 1002 Router, follow this procedure:

-
- Step 1** Slip on the ESD-preventive wrist strap that was included in the accessory kit.
- Step 2** Using the handles on both sides of the module, with two hands, gently insert the Cisco ESP5 or -ESP10 into the top chassis slot.



Note Handle the Cisco ESP5 and ESP10 by the carrier edges only; never touch the printed circuit board components or connector pins.

- Step 3** Once the board is seated, tighten the captive screws.
- Step 4** Place the Cisco ESP5 or Cisco ESP10 on an antistatic surface with its printed circuit board components facing upward or in a static shielding bag.
-

You have completed the procedure for replacing the Cisco ESP5 or ESP10.

Replace the Shared Port Adapters

The shared port adapters (SPAs) on the embedded Cisco ASR1000-SIP10 in the Cisco ASR 1002 Router support online insertion and removal (OIR); but the embedded Cisco ASR1000-SIP10 does not support OIR and is not field-upgradeable.



Note Cabling information is included with the specific shared port adapter documentation.

Before removing any shared port adapter, shut down the interface so that there is no traffic running through the shared port adapter when it is removed. Removing a shared port adapter while traffic is flowing through the ports can cause system disruption.

-
- Step 1** Attach an ESD wrist strap between you and an unpainted chassis surface.
 - Step 2** Disconnect all cables from the shared port adapter.
 - Step 3** Remove the shared port adapter from the chassis subslot. Grasp the handle and pull the shared port adapter or blank panel from the router.
 - Step 4** Locate the shared port adapter slot guides inside the Cisco ASR 1002 Router.



Caution The shared port adapter must slide into the slot guides under the chassis lid. Do not allow the shared port adapter components to come in contact with the system board or the shared port adapter could be damaged.

- Step 5** Carefully slide the shared port adapter into the shared port adapter slot until it is firmly seated and then securely tightened the captive screws. When installed, the shared port adapter input/output panel should be flush with the face of the router.
 - Step 6** Reconnect any cables and place the cables through the cable-management brackets.
 - Step 7** If the shared port adapter fails to come up, reseal or reinsert the shared port adapter; do not use excessive force.
 - Step 8** Power on the router by turning the power switch to the on (I) position.
-

Replace a Power Supply in the Cisco ASR 1002 Router

This section provides instructions for removing the AC power supply, the -48V DC and +24V DC power supply from a Cisco ASR 1002 Router. This section contains the following topics:

- [Removing an AC Power Supply, page 40](#)
- [Removing the -48V DC Power Supply, page 41](#)
- [Removing the +24V DC Power Supply, page 42](#)

Before you begin, make certain the chassis is grounded.



Note Two power supplies must be installed in the chassis at all times, with a minimum of one power supply connected to the mains in order to power on the system and ensure sufficient cooling. The system fans are inside the power supply units and must spin for cooling. Because all the system fans can be powered by one power supply, the second power supply unit does not have to be powered on, but must be connected.



Caution If you remove a power supply from a system that are connected and powered on, the system can run only for a maximum of five minutes before shutting down. However, because the fans and power elements are independent within the power supply, the replacement power supply does not have to be energized within five minutes. The only requirement is that the power supply be installed in the chassis in order to energize the fans and maintain proper system cooling.

Removing an AC Power Supply

To remove a Cisco ASR 1002 Router AC power supply that is not operating normally (and then replace the AC power supply within five minutes), follow this procedure:

-
- Step 1** Slip on the ESD-preventive wrist strap that was included in the accessory kit.
 - Step 2** Turn the switch to the off (O) position and unplug the AC power cord.

Step 3 Unscrew all of the power supply captive screws.

Step 4 Grasping the power supply handles, pull the power supply from the chassis. When you remove the AC power supply, you will see the following type of messages in the log report:

```
#show log
Syslog logging: enabled (0 messages dropped, 6 messages rate-limited, 0 flushes, 0 overruns, xml
disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

  Console logging: disabled
  Monitor logging: level debugging, 0 messages logged, xml disabled,
                    filtering disabled
  Buffer logging:  level debugging, 81 messages logged, xml disabled,
                    filtering disabled
  Exception Logging: size (4096 bytes)
  Count and timestamp logging messages: disabled
  Persistent logging: disabled

No active filter modules.

  Trap logging: level informational, 78 message lines logged

Log Buffer (10000000 bytes):

*Jan 10 06:08:14.713: %CMRP-3-PEM_REMOVE_SHUT: R0/0: cmand: The system will shut down in 5 minutes
*Jan 10 06:08:14.718: %ASR1000_PEM-6-REMPFM_FM: PEM/FM slot P1 removed
*Jan 10 06:08:28.966: %ASR1000_PEM-6-INSPEM_FM: PEM/FM slot P1 inserted
```

The second is after enabling console logging. Output is at the console (and in the log).

```
2ru_perf2#conf Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
2ru_perf2(config)#log con
% Ambiguous command: "log con"
2ru_perf2(config)#logg con
2ru_perf2(config)#^Z
2ru_perf2#
*Jan 10 06:08:54.643: %SYS-5-CONFIG_I: Configured from console by console
2ru_perf2#
2ru_perf2# *Jan 10 06:09:05.023: %CMRP-3-PEM_REMOVE_SHUT: R0/0: cmand: The system will shut down in 5
minutes
*Jan 10 06:09:05.026: %ASR1000_PEM-6-REMPFM_FM: PEM/FM slot P0 removed
*Jan 10 06:09:10.500: %ASR1000_PEM-6-INSPEM_FM: PEM/FM slot P0 inserted
2ru_perf2#
```

Step 5 Replace the AC power supply within five minutes or the system will shutdown

You have removed an AC power supply from the Cisco ASR 1002 Router and now must replace the AC power supply within five minutes. For replacing the AC power supply into the Cisco ASR 1002 Router, see [Connecting AC Power to the Cisco ASR 1002 Router](#), page 17.

Removing the –48V DC Power Supply

Before you can remove a –48V DC power supply from the Cisco ASR 1002 Router, you must remove power from the power supply.



Caution

Make certain that the chassis ground is connected before you begin removing and installing the power supply.

To remove the –48V DC power supply from the Cisco ASR 1002 Router, follow this procedure:

-
- Step 1** Slip on the ESD-preventive wrist strap that was included in the accessory kit.
- Step 2** Place the power supply switch in the Standby position.
- Step 3** Turn off the branch circuit breaker before touching terminal screws. Then start loosening terminal block screws to remove wires.
- Step 4** Remove the ground leads from the terminal block in this order:
- Negative ground lead
 - Positive ground lead
 - Ground lead
- Step 5** Unscrew all of the power supply captive installation screws.



Note Two power supplies must be installed in the chassis at all times, with a minimum of one power supply connected to the mains in order to power on the system and ensure sufficient cooling. The system fans are inside the power supply units and must spin for cooling. Because all the system fans can be powered by one power supply, the second power supply unit does not have to be powered on, but must be connected.



Caution If you remove a power supply from a system that has two power supplies that are connected and powered on, the system can run only for a maximum of five minutes before shutting down. However, because the fans and power elements are independent within the power supply, the replacement power supply does not have to be energized within five minutes. The only requirement is that the power supply be installed in the chassis in order to energize the fans and maintain proper system cooling.

- Step 6** Grasping the power supply handles, pull the power supply from the chassis.
- Step 7** Replace the –48V DC power supply within five minutes or the system will shutdown.
-

You have completed the procedure for removing a –48V DC power supply from the Cisco ASR 1002 Router. For replacing the –48V DC power supply into the Cisco ASR 1002 Router, see [Connecting –48V DC power to the Cisco ASR 1002 Router](#), page 18.

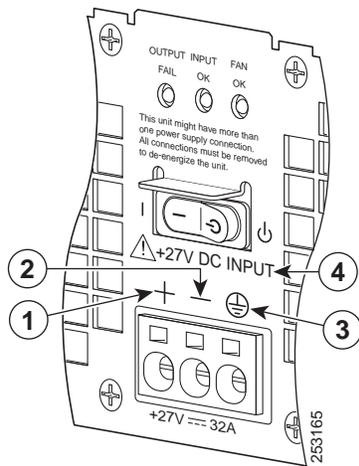
Removing the +24V DC Power Supply

This section provides information about removing a +24V DC power supply from the Cisco ASR 1002 Router.

Before you begin, read the following notices:

- The labeling displays +27V DC INPUT. This labeling describes the nominal voltage provided at a cell site.
- Observe the polarity location—Unlike the polarity labels of the –48V DC power supply (ground, positive, negative), the polarity labels on the +24V DC are ground, negative, positive as shown in [Figure 27](#) from right to left as they appear on the actual power supply unit.

Figure 27 Cisco ASR 1002 Router +24V DC Power Supply Terminal Block and Labels



1	Positive (+) lead	3	Ground (GND) lead
2	Negative (-) lead	4	+27V DC label

- The ground (GND) lead is always installed first and removed last.
- The +24V DC power supply uses a spring loaded terminal block; therefore have the recommended screwdriver size available.
- Review the diagrams to see how the wire is stripped and how the screwdriver is inserted at an angle into the terminal block.
- Have the following equipment available to install and remove the +24V DC power supply:
 - Phoenix Contact 3.5mm flat-blade screwdriver or equivalent
 - Wire-stripping tool for stripping 8-gauge wire

Before you can remove a +24V DC power supply from the Cisco ASR 1002 Router, you must remove input power going to the power supply.

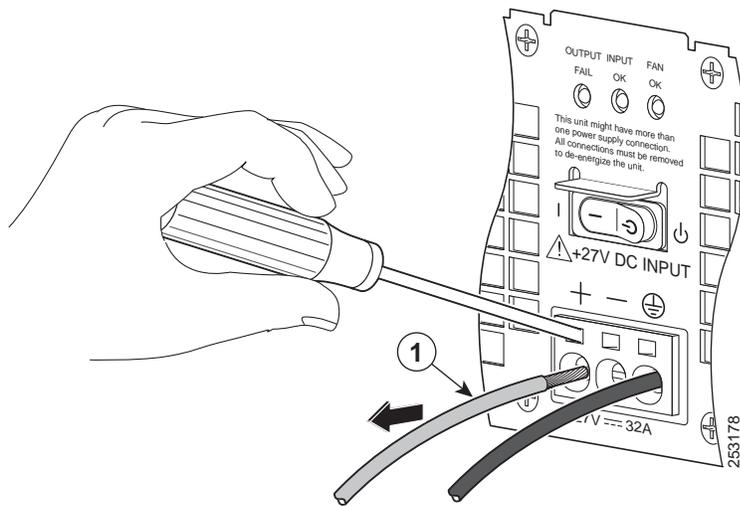


Caution Make certain that the chassis ground lead wire is connected before you begin removing and installing the power supply.

To remove the +24V DC power supply from the Cisco ASR 1002 Router, follow these steps:

- Step 1** Slip on the ESD-preventive wrist strap that was included in the accessory kit.
- Step 2** Place the power supply Standby switch in the Standby position.
- Step 3** Using the recommended screwdriver, insert the screwdriver at an angle, pushing forward to release the internal spring contact on the lead wire and then gently pull out the wire.
The screwdriver remains pushed into the spring release opening until the wire is completely removed.

Figure 28 Removing the Cisco ASR 1002 Router +24V DC Power Supply Lead Wires



1	Pull lead wire out from terminal		
---	----------------------------------	--	--

Step 4 Remove the screwdriver and continue removing the remaining lead wires from the terminal block, repeating Step 3 and Step 4 for each lead wire.



Tip If the 8-gauge input wiring is very rigid or a solid wire, then a screwdriver might not be necessary. As a result of using few-strand heavy gauge wiring, you can insert the wire into the terminal block to release the spring tension. After inserting the lead wire, gently pull on the wire to make certain that the wire is secured. Make certain that no wire is exposed and that only wire insulation is seen.

Step 5 Unscrew the two power supply captive screws.



Note

Two power supplies must be installed in the chassis at all times, with a minimum of one power supply connected to the mains in order to power on the system and ensure sufficient cooling. The system fans are inside the power supply units and must spin for cooling. Because all the system fans can be powered by one power supply, the second power supply unit does not have to be powered on, but must be connected.



Caution

If you remove a power supply from a system that has two power supplies that are connected and powered on, the system can run only for a maximum of five minutes before shutting down. However, because the fans and power elements are independent within the power supply, the replacement power supply does not have to be energized within five minutes. The only requirement is that the power supply be installed in the chassis in order to energize the fans and maintain proper system cooling.

Step 6 Grasping the power supply handles, pull the power supply from the chassis.

Step 7 Replace the +24V DC power supply within five minutes.

You have completed the procedure for removing a +24V DC power supply from the Cisco ASR 1002 Router. For replacing the +24V DC power supply into the Cisco ASR 1002 Router, see [Connecting +24V DC Power to the Cisco ASR 1002 Router](#), page 22.



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